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COMMUNICATION GAME SYSTEM AND KEY CARD FOR CONTINUOUSLY  
PLAYING THE GAME  
[TSUSHINGEIMUSISUTEMU OYOBI GEIMUKEIZOKUYO KIIKADO]

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[What is Claimed is:]

[Claim 1]

A communication game system, wherein a plurality of game terminals are connected via communication lines to a host computer, which stores a plurality of types of game programs, characterized in that:

each of said game programs, which are stored in said host computer, has a tree structure, which is made from a plurality of hierarchical stages wherein the story is developed;

each of said game terminals is comprised of printing/reading means for a key card for continuously playing the game, wherein at least game restart information, which specifies a hierarchical stage of a program, is printed on said key card in the form of a two-dimensional code, and the game restart information is read when said key card is inserted;

when the user inserts said key card into said printing/reading means for said key card of one of said game terminals, starts a game and later interrupts the running game, said printing/reading means for the key card

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<sup>1</sup> Numbers in the margin indicate pagination in the foreign text.

outputs the game restart information and prints it on the key card; and

when the user restarts the interrupted game, he/she inserts the key card, wherein said game restart information is printed, into the printing/reading means for the key card of one of said game terminals so that the game restart information, which is printed in the form of a two-dimensional code, is read, and the game, which is specified by the game restart information, can be restarted from the hierarchical stage wherein the game is interrupted.

[Claim 2]

The communication game system, as set forth in claim 1, characterized in that:

said key card for continuously playing the game has a rewritable region, which is made from a reversible thermal material;

each printing means of said printing/reading means for the key card of said plurality of game terminals has a thermal head type printer; and

when the user interrupts the running game, the printing means of said printing/reading means for the key card outputs the game restart information and prints it on said rewritable region of the key card.

[Claim 3]

The communication game system, as set forth in claim 1 or 2, characterized in that:

each of said game programs, which are stored in said host computer, has an identification code, which specifies each of the game programs, and each of the hierarchical stages of each of the game programs, which is made from a tree structure, has a stage identification code, which specifies each of said hierarchical stages; and

the game restart information, which is printed on said key card in the form of a two-dimensional code, is comprised of:

an identification code for specifying the game program, which is selected when the user interrupts the running game by operating the game terminal; and

a stage identification code for the hierarchical stage of said game program, which is reached by the user when he/she interrupts the running game by operating the game terminal.

[Claim 4]

The communication game system, as set forth in one of claims 1 to 4, characterized in that:

each of said hierarchical stages, which constitutes a tree structure of each of said game programs stored in said

host computer, has a character, which symbolizes each of the hierarchical stages; and

said character, which symbolizes the hierarchical stage reached by the user when he/she interrupts the running game by operating the game terminal, is printed on said key card, which is inserted into said printing/reading means for the key card.

[Claim 5]

The communication game system, as set forth in one of claims 1 to 4, characterized in that:

each of said game programs, which are stored in said host computer, has predetermined message information corresponding to each of said characters, which symbolizes each of said hierarchical stages; and

said predetermined message information, which corresponds to said character symbolizing the hierarchical stage reached by the user when he/she interrupts the running game by operating the game terminal, is printed on said key card, which is inserted into said printing/reading means for the key card.

[Claim 6]

The communication game system, as set forth in one of claims 1 to 5, characterized in that income information is printed, in the form of a two-dimensional code, on said key

card, which is inserted into said printing/reading means for the key card.

[Claim 7]

A key card for continuously playing the game, wherein the game restart information, which at least includes:

an identification code for specifying the game program with a tree structure, which is made from a plurality of hierarchical stages wherein the story is developed; and

a stage identification code for specifying the hierarchical stage, which is reached by the user when he/she interrupts the running game by operating the game program, is printed on an appropriate place of the main body of said card in the form of a two-dimensional code.

[Claim 8]

The key card, as set forth in claim 7, for continuously playing the game, wherein said game restart information is rewritably printed in the form of a two-dimensional code.

[Claim 9]

The key card, as set forth in claim 7, for continuously playing the game, wherein said game restart information is sequentially and recordably printed in the form of a two-dimensional code.

[Claim 10]

The key card, as set forth in one of claims 7 to 9, for continuously playing the game, wherein the character, which symbolizes the hierarchical stage reached by the user when he/she interrupts the running game by operating the game terminal, is printed on an appropriate place of the main body of said card.

[Claim 11]

The key card, as set forth in claim 10, for continuously playing the game, wherein the character, which is printed on an appropriate part of the main body of said card, is rewritably printed.

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[Claim 12]

The key card, as set forth in claim 10, for continuously playing the game, wherein the character, which is printed on an appropriate part of the main body of said card, is sequentially and recordably printed.

[Detailed Description of the Invention]

[0001]

[Field of the Invention]

The present invention relates to a communication game system and key card for continuously playing the game. More particularly, the present invention relates to a



communication game system, wherein, even when the running game is interrupted, a key card for continuously playing the game, wherein the game restart information is stored, can be issued from one of several game terminals so that the game can be continuously played from the hierarchical stage, wherein the game is previously interrupted. In addition, the present invention relates to the corresponding key card, wherein the user can visually enjoy the card itself.

[0002]

[Prior Arts]

Recently, a communication game system below has been installed in the game center and the like. In the communication game system, a game terminal is connected to a host computer via communication lines and the user can select one of a plurality of types of game programs, which are stored in said host computer and load (forward) to said game terminal. As a result, the user can enjoy several different games with a single game terminal.

[0003]

Figure 12 is a schematic view illustrating the structure of the conventional communication game system. Communication game system 101 is comprised of host computer 102, game

terminals 103, which are connected to host computer 102 via communication lines (ISDN) L.

[0004]

Here, in Figure 12, the component shown by 104 represents a PBX. In addition, Figure 13 is a perspective view illustrating the structure of the conventional game terminal. Game terminal 103 is comprised of display means 105 such as CRT and operational means 106 such as push buttons 106a and joy stick 106b, which are used during the game.

[0005]

Furthermore, game terminal 103 is connected to coin inserter 107. When the user is to play the game in game terminal 103, he/she inserts coins, which cover the game cost, into coin inserter 107. In accordance with message information, which is displayed on display means 105 when the coins are inserted, the user selects a game program, which he/she wants to play.

[0006]

The information on the game program, which is selected by the user in the side of game terminal 103, is transmitted to host computer 102 via communication line L. After receiving the information on the game program selected by the user, which is transmitted from game terminal 103, host

computer 102 loads the corresponding game program to game terminal 103.

[0007]

As a result, since the game, which is selected by the user, goes standby in the side of game terminal 103, the user can enjoy the game, which he/she has selected in game terminal 103. According to communication game system 101, the user can enjoy a plurality of games with single game terminal 103. Therefore, compared with the specialized game device, which is individually developed for a single game, it is possible to play many types of games in a small space. In addition, the user can enjoy a plurality of games with single game terminal 103 without moving the place.

[0008]

[Problems to be Solved by the Invention]

According to conventional communication game system 101, however, it is not possible to terminate the game until the user wins the game thereby "finishing the game as the winner", the user loses the game, the time runs out, or the "Game is over" because the fee runs out.

[0009]

Therefore, when the user no longer has the time to play, he/she lets him/herself to lose the game regardless of the development of the game so that the game is over. In

addition, according to the setting of conventional communication game system 101, the user can only participate in the game from the initial stage and it is difficult for him/her to participate in the game from a given stage.

[0010]

Based on the above described situation, the manufacturers and distributors of the communication game system have received the demand from the user that they must develop a communication game system, wherein the user can interrupt the running game in game terminal 103 and restart the game from the stage, wherein the game is previously interrupted, in game terminal 103, which is located in a different place.

[0011]

To develop the above described communication game system, it is first considered that a communication game system using a magnetic card as the recording medium is developed. However, the magnetic card is already widely used as a prepaid card, commuter pass and caching card and the like, does not have novelty. If the magnetic card is used as the recording medium for the communication game system, it is ordinary and lacks spice.

[0012]

In addition, since data, which is recorded in the magnetic card, is not visual, if visual information is printed on the card to add spice to the card, it is necessary to separately create a printing means other than the magnetic recording means. As a result, the device is complicated. Furthermore, even when pretty patterns are printed on the card, if the printing matter is dormant and fixed, the user may be tired of looking at it.

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[0013]

In addition, even in the case wherein a variety of patterns are printed on the card and the limited number of said cards is put on sale so that the card becomes a memorabilia, the card collection of this kind is already made by telephone cards and the like and lacks novelty and spice. The present invention was created to solve the above described problems and attempts to provide a communication game system, characterized in that, after a game, which is played in a game terminal in a game center in one place, is interrupted, said game can be restarted in a game terminal in another place from the stage, wherein said game is previously interrupted, and a card, which is used for said communication game system, has spice and novelty. In

addition, the present invention attempts to provide a key card for continuously playing the game, which is used for said communication game system and can be visually enjoyed by the user.

[0014]

[Means to Solve the Problems]

According to the communication game system as set forth in claim 1, wherein a plurality of game terminals are connected via communication lines to a host computer, which stores a plurality of types of game programs, each of said game programs, which are stored in said host computer, has a tree structure, which is made from a plurality of hierarchical stages wherein the story is developed. Each of said game terminals is comprised of printing/reading means for a key card for continuously playing the game. The printing/reading means prints at least game restart information, which specifies a hierarchical stage of a program, on said key card in the form of a two-dimensional code. At the same time, the printing/reading means reads the game restart information when said key card is inserted. When the user inserts said key card into said printing/reading means for said key card of one of said game terminals, starts a game and later interrupts the running game, said printing/reading means for the key card

outputs the game restart information and prints it on the key card. When the user restarts the interrupted game, he/she inserts the key card, wherein said game restart information is printed, into the printing/reading means for the key card of one of said game terminals. As a result, the game restart information, which is printed in the form of a two-dimensional code, is read, and the game, which is specified by the game restart information, can be restarted from the hierarchical stage wherein the game is interrupted.

[0015]

According to the above described communication game system, a key card for continuously playing the game, wherein the game restart information is printed in the form of a two-dimensional code, is used as the recording medium. When the user plays a game halfway in a game terminal, which is installed in one place, and then interrupts the game, he/she can restart the game from the stage, wherein the game is previously interrupted, in another time or in another game terminal, which is installed in another place, simply by inserting the above described key card into the printing/reading means for the key card of said different game terminal installed in said different place.

[0016]

According to the conventional communication game system, when the user is playing a game in a game terminal, which is installed in one place, and no longer has the time to play, he/she forces the end of the game and starts the game from the beginning with another game terminal, which is installed in another place. This spoils the game. Instead, according to the communication game system of the present invention, the user does not have to play the game in a manner described above. In addition, according to the communication game system of the present invention, since the game restart information is printed in the form of a two-dimensional code, compared with the one-dimensional bar code, it is possible to record a large volume of information in a small region.

[0017]

Furthermore, according to the communication game system of the present invention, different from the case of the one-dimensional bar code, there is no rigid standard on the thickness of the lines and the intervals between each of the lines. Therefore, as the printing means, it is not necessary to use a special printer, which is required for the case of the one-dimensional bar code. Instead, it is possible to use a commonly-available printing means.



Therefore, it is possible to keep the manufacturing cost of the communication game system low. According to the communication game system as set forth in claim 2, the key card, which is used in the communication game system as set forth in claim 1, for continuously playing the game has a rewritable region, which is made from a reversible thermal material. In the key card for continuously playing the game, each printing means of said printing/reading means for the key card of said plurality of game terminals has a thermal head type printer. When the user interrupts the running game, the printing means of said printing/reading means for the key card outputs the game restart information and prints it on said rewritable region of the key card.

[0018]

Here, the term "reversible thermal material" of the present specification means a rewritable material, which becomes white, red or blue when it is heated from room temperature to a certain temperature, and then maintains the color at a certain temperature. When said material is heated again from room temperature to still another temperature, it becomes another color, which is different from the one when it is heated for the first time, for example, transparent, blue or red. Then, the material maintains the color.

[0019]

Examples of the above described reversible thermal material include: the reversible thermal material, which is used in the thermoreversible recording medium disclosed in Japanese unexamined published application No. Hei 8-25808; the reversible thermal material disclosed in Japanese unexamined published application No. Sho 55-154198, wherein the material becomes transparent at the first specified temperature and clouded at the second specified temperature; the reversible thermal material disclosed in Japanese unexamined published application No. Hei 2-414438, wherein the material is colored at the second specified temperature and loses the color at the first specified temperature; the reversible thermal material disclosed in Japanese unexamined published application No. Hei 3-16950, wherein the material becomes clouded at the first specified temperature and transparent at the second specified temperature; and the reversible thermal material disclosed in Japanese unexamined published application No. Hei 2-188293, wherein the material becomes black, red or blue at the first specified temperature and loses the color at the second specified temperature.

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[0020]

According to the above described communication game system, a rewritable region, which is made from a reversible thermal material, is created on the key card, which is used as the recording medium, so that the game restart information is printed on the card by a thermal head type printer. Therefore, it is no longer necessary to supply ink to the printing means of the printing/reading means for the key card. As a result, it is no longer necessary to do the maintenance operations such as inspection of the ink shortage in the printing/reading means for the key card and the corresponding ink replenishment. Consequently, it is possible to decrease the workload of the maintenance workers such as employees of the game center and the service engineers for the communication game system.

[0021]

According to the communication game system as set forth in claim 3, each of said game programs of the communication game system, as set forth in claim 1 or 2, which are stored in said host computer, has an identification code, which specifies each of the game programs. Each of the hierarchical stages of each of the game programs, which is made from a tree structure, has a stage identification code, which specifies each of said hierarchical stages. The

game restart information, which is printed on said key card in the form of a two-dimensional code, is comprised of: an identification code for specifying the game program, which is selected when the user interrupts the running game by operating the game terminal; and a stage identification code for the hierarchical stage of said game program, which is reached by the user when he/she interrupts the running game by operating the game terminal.

[0022]

According to the above described communication game system, an identification code for specifying the game program, is assigned to each of the game programs, which are stored in the host computer, and a stage identification code for specifying the hierarchical stage, is assigned to each of the hierarchical stages, which constitute a tree structure of each of the game programs. The identification code specifying the game program, which is interrupted by the user, and the stage identification code of the hierarchical stage, which is reached by the user when he/she interrupts the game, are printed on the key card in the form of a two-dimensional code. Based on the two-dimensional code, which is printed on the key card, it is possible to easily specify the game program, which is interrupted by the user, and the hierarchical stage, which is reached by the user

when he/she interrupts the game. Therefore, by inserting the key card into the printing/reading means for the key card, the user can restart the interrupted game from the stage, wherein the game is previously interrupted.

[0023]

According to the communication game system as set forth in claim 4, each of said hierarchical stages constituting a tree structure of each of said game programs of the communication game system, as set forth in one of claims 1 to 3, which are stored in said host computer, has a character, which symbolizes each of the hierarchical stages. The above described character, which symbolizes the hierarchical stage reached by the user when he/she interrupts the running game by operating the game terminal, is printed on said key card, which is inserted into said printing/reading means for the key card.

[0024]

According to the above described communication game system, the character, which symbolizes the hierarchical stage reached by the user when he/she interrupts the running game by operating the game terminal, is printed on the key card. As a result, since it is entertaining to look at the key card, the key card itself becomes the subject of a collection in a manner similar to the telephone card,

baseball card, monster card and menko (pogs) and the like. Consequently, collecting the key cards gives the user another pleasure other than the pleasure of playing the game.

[0025]

According to the communication game system as set forth in claim 5, each of said game programs of the communication game system, as set forth in one of claims 1 to 4, which are stored in said host computer, has predetermined message information corresponding to each of said characters, which symbolizes each of said hierarchical stages. The predetermined message information, which corresponds to said character symbolizing the hierarchical stage reached by the user when he/she interrupts the running game by operating the game terminal, is printed on said key card, which is inserted into said printing/reading means for the key card.

[0026]

According to the above described communication game system, in addition to the character, which symbolizes the hierarchical stage reached by the user when he/she interrupts the running game by operating the game terminal, the message of said character is also printed on the key card. Therefore, it is entertaining to look at the key card

as well as read the message on it. As a result, the key card itself becomes the subject of a collection in a manner similar to the telephone card, baseball card, monster card and menko (pogs) and the like. Consequently, collecting the key cards gives the user another pleasure other than the pleasure of playing the game.

[0027]

According to the communication game system as set forth in claim 6, the communication game system, as set forth in one of claims 1 to 5, prints income information, in the form of a two-dimensional code, on said key card, which is inserted into said printing/reading means for the key card.

According to the above described communication game system, since the income information is included in the two-dimensional code, which is printed on the key card, it is possible to use the key card as the prepaid card in the game center.

[0028]

According to the key card, as set forth in claim 7, for continuously playing the game, the game restart information, which at least includes: an identification code for specifying the game program with a tree structure, which is made from a plurality of hierarchical stages wherein the story is developed; and a stage identification

code for specifying the hierarchical stage, which is reached by the user when he/she interrupts the running game by operating the game program, is printed on an appropriate place of the main body of said card in the form of a two-dimensional code.

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[0029]

The game restart information in the form of a two-dimensional code may be printed on the key card by ink or toner. Alternately, a rewritable region, which is made from a reversible thermal material, is created on the key card. The game restart information may be printed on the above described rewritable region by thermal transfer.

[0030]

Since the two-dimensional code is recognized as a pattern by the human eyes, it gives spice to the key card itself. As a result, the key card does become the subject of a collection in a manner similar to the telephone card and menko (pogs) and the like. Consequently, collecting the key cards gives the user another pleasure other than the pleasure of playing the game.

[0031]

According to the key card, as set forth in claim 8, for continuously playing the game, the game restart information



of the key card, as set forth in claim 7, is rewritably printed in the form of a two-dimensional code. According to the above described key card, since the game restart information is rewritably printed in the form of a two-dimensional code, as the game advances, the form of the two-dimensional code changes and thus the user can enjoy the ever-changing two-dimensional code as patterns.

[0032]

According to the key card, as set forth in claim 9, for continuously playing the game, the game restart information of the key card, as set forth in claim 7, is sequentially and recordably printed in the form of a two-dimensional code. According to the above described key card, since the game restart information is sequentially and recordably printed in the form of a two-dimensional code, when the user finishes the game as the winner or lets the game end, he/she can enjoy reading the game history from a plurality of two-dimensional codes, which are sequentially and recordably printed.

[0033]

According to the key card, as set forth in claim 10, for continuously playing the game, the character, which symbolizes the hierarchical stage reached by the user when he/she interrupts the running game by operating the game

terminal, is printed on an appropriate place of the main body of the key card, as set forth in one of claims 7 to 9. According to the above described key card, other than the character, which symbolizes the hierarchical stage reached by the user when he/she interrupts the running game by operating the game terminal, the message of said character is also printed on the key card. Therefore, it is entertaining to look at the key card as well as read the message on it. As a result, the key card does become the subject of a collection in a manner similar to the telephone card and menko (pogs) and the like. Consequently, collecting the key cards gives the user another pleasure other than the pleasure of playing the game.

[0034]

According to the key card, as set forth in claim 11, for continuously playing the game, the character, which is printed on an appropriate part of the main body of the key card, as set forth in claim 10, is rewritably printed. According to the above described key card, since the character is rewritten in sequence as the game advances, in addition to the pleasure of playing the game, the user can enjoy the growth of the character from the ever-changing character as the game advances.

[0035]

According to the key card, as set forth in claim 12, for continuously playing the game, the character, which is printed on an appropriate part of the main body of the key card, as set forth in claim 10, is sequentially and recordably printed. According to the above described key card, since the character is sequentially and recordably printed as the game advances, when the user finishes the game as the winner or lets the game end, he/she can enjoy the game history from a plurality of characters, which are sequentially and recordably printed.

[0036]

[Preferred Embodiment of the Invention]

Next, an embodiment of the communication game system according to the present invention will be described in more detail by referring to the drawings. Figure 1 is a schematic view illustrating the structure of the communication game system of the present invention.

[0037]

Communication game system 1 is comprised of host computer 2, game terminals 3, which are connected to host computer 2 via communication lines (ISDN) L. Here, in Figure 1, the component shown by 4 represents a PBX. In addition, Figure 2 is a perspective view illustrating the structure of the

game terminal, which is used in communication game system 1.

[0038]

Game terminal 3 is comprised of display means 5 such as CRT and operational means 6 such as push buttons 6a and joy stick 6b, which are used during the game. Furthermore, game terminal 3 is connected to coin inserter 7.

[0039]

In addition, multiple types of game programs are stored in host computer 2 as the database. The above described structure of game terminal 3 is the same as that of conventional game terminal 103. According to communication game system 1, as shown in Figure 3, an identification code (ID) for specifying each of the game programs is assigned to each of the game programs, which are stored in host computer 2 as the database.

[0040]

As shown in Figure 4, each of the game programs has a stage identification code for specifying each of the hierarchical stages and a character, which symbolizes each of said hierarchical stages. Depending on the operational condition wherein the user uses in each of the stages, a different character is created in each of the stages. As the user advances the game, the character sequentially grows.

[0041]

Here, according to the present embodiment, the process, wherein an insect becomes an adult insect from a young worm, is shown. This is simply an example and the present invention is not limited to this example neither a similar type of growing/rearing game. It is possible to apply the present embodiment to a combat game and the like, wherein, as the story develops, the character sequentially obtains combat items (for example, sword, rifle, missile and the like) by operations made in each of the stages and, as the user advances the game, the combat power of the character is increased.

[0042]

In addition, according to the above described example, as shown in Figure 5, each of the game programs, which are stored in host computer 2, has message information corresponding to the character, which symbolizes each of the hierarchical stages. Here, according to the example of Figure 5, the messages are expressed by writing. This is simply an example of the present embodiment. The messages are not limited to writing. For example, in a combat game and the like, pictures, which imaging the obtained combat items (for example, sword, rifle, missile and the like), or

a bar graph expressing the obtained combat power may be used.

[0043]

Here, in the case wherein a game program "XXX" is selected in the side of game terminal 3, for example, and the user advances the game until the hierarchical stage, which is shown by a white arrow in Figure 4, the identification code of the game program and the stage identification code are connected thereby specifying the stage shown by the white arrow as "0-1-1-1".

[0044]

In addition, as shown in Figure 2, game terminals 3 is connected to printing/reading means 8 for the key card. Furthermore, according to communication game system 1, key card C is used as the recording medium. According to communication game system 1, when key card C is inserted through card insertion opening 8a of printing/reading means 8 for the key card, printing/reading means 8 for the key card can write and store game information in key card C and allow key card C to read the stored information.

[0045]

Figure 6 is a planar view illustrating key card C. Figure 7 is a cross-sectional view illustrating the rewritable region of key card C. As shown in Figure 6, two-dimensional

code cp, which includes the game restart information, character ch and message m are rewritably written in rewritable region Rc of key card C.

[0046]

According to the present embodiment, a matrix-type code (two-dimensional matrix code) is used as two-dimensional code cp. More particularly, among the matrix-type codes, two-dimensional code cp has the structure of a CP code (Computer Purpose Code) (trademark of Japan ID Tech Co., Ltd.).

[0047]

CP code cp has a structure, wherein the total number of grids, which are called "cells", is 144 [12 (1 to 12 rows) x 12]. In addition, code cp has X-coordinate baseline (X reference line) Lx and Y-coordinate baseline (Y reference line) Ly. Furthermore, timing marks (also called "tick mark") Ta and Tb are created at regular intervals along each of X-coordinate baseline Lx and Y-coordinate baseline Ly.

[0048]

In addition, supplementary mark (also called "corner mark") Mc is created in a predetermined position, wherein the L-shaped intersecting angle, which is made by X-coordinate baseline Lx and Y-coordinate baseline Ly, is 90 degrees.

Based on timing marks Ta, which are created at regular intervals (here, at every other cell) along X-coordinate baseline Lx (12 rows), and timing marks Tb, which are created at regular intervals (here, at every other cell) along Y-coordinate baseline Ly (column A), CP code cp specifies the coordinate position of each of the cells (except supplementary mark Mc), which constitute the rows (1 to 10 rows) and columns (columns C to L). Therefore, even if two-dimensional code cp is skewed, it is possible to correctly specify the coordinate positions.

[0049]

Furthermore, since supplementary mark Mc is created, even if two-dimensional code cp is attached upside down, left-right reversed, or inside out, it is possible to read the information written in CP code cp. According to the present embodiment, the two-dimensionally encoded game restart information, which includes the identification code for specifying a game program, and the hierarchical stage identification code for specifying the hierarchical stage of said game program, is expressed in the region, wherein the L-shaped intersecting angle, which is made by X-coordinate baseline Lx and Y-coordinate baseline Ly, is 90 degrees.



[0050]

Here, according to the present embodiment, each of the cells is made from a plurality of pixels (for example, 4 pixels). If the number of black pixels is equal to and more than a predetermined amount, the cell is considered black. If the number of black pixels is less than a predetermined amount, the cell is considered white. Each of these cells constitutes the bit information (binary data). Based on the above described bit information, it is possible to express variety of languages in the world other than alphanumeric characters, kanji characters and kana characters.

[0051]

For example, in the case wherein a hexadecimal number is expressed by four cells and a JIS kanji code is expressed by 16 cells, kanji "ichi" is expressed by code "306C", kanji "ni" is expressed by code "4673", and kanji "san" is expressed by code "3B30". Here, the bit information can include error-correction data at a predetermined proportion. As a result, even when two-dimensional code cp is contaminated or broken, it is possible to automatically recover the data (user data).

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In addition, CP code cp has an excellent advantage that, even if the amount of user data is changed, by changing the

proportion of the error-correction data, it is possible to constantly maintain the size of two-dimensional code cp.

[0052]

As shown in Figure 7, rewritable region Rc is comprised of substrate 11, which is the mount for the key card, heat-resistant layer 12, which is formed on the surface of substrate 11, and reversible thermal recording material layer 14, which is formed on the surface of heat-resistant layer 12 surrounding air layer 13. According to the present embodiment, a polyester film (made by Toray Co., Ltd., S type) with a thickness of about 100  $\mu\text{m}$  is used as substrate 11. Aluminum deposited film 11a with a thickness of about 800 Å is formed on rewritable region R on the surface of substrate 11. A mixture of 10 portions of C7-168 (S.C 49 wt. %, ultraviolet curing resin, made by Dainippon Ink & Chemicals Co., Ltd.), 10 portions of toluene and 0.5 portion of BYK-301 (silicon oil, made by BYK Japan Co., Ltd.) is coated on the surface of aluminum deposited film 11a by using a wire bar and dried at 90 °C for 1 minute. Then, the surface is irradiated by an UV lamp with 80 W for about 1 second thereby forming heat-resistant layer 12 with a thickness of about 0.5  $\mu\text{m}$ .

[0053]

In addition, as reversible thermal recording material layer 14, a mixture of 0.5 portion of behenic acid (made by Miyoshi Oil and Fat Co., Ltd., Behenic Acid 95), 0.5 portion of icosanic diacid (made by Okamura Seiyu Co., Ltd., SL-20), 40 portions of vinyl chloride-vinyl acetate copolymer (made by UCC Co., Ltd., VYHH), 15 portions of THF, 5 portions of toluene and 0.01 portion of silicon oil (made by Shin-etsu Chemical Co., Ltd., KF50) is coated on a polyester film (made by Teijin Co., Ltd., HL-7) with a thickness of about 188  $\mu\text{m}$  by using a wire bar and dried at 110 °C for 3 minutes thereby forming a reversible thermal recording material main layer (thickness of about 15  $\mu\text{m}$ ). Then, as the protection layer for protecting said reversible thermal recording material main layer (thickness of about 15  $\mu\text{m}$ ), a mixture of 10 portions of ultraviolet curing resin (made by Dainippon Ink & Chemicals Co. Ltd., C7-157), 10 portions of IPA and 0.5 portion of BYK-301 is coated on said layer by using the wire bar and dried at 90°C for 1 minute. Subsequently, the surface is irradiated by an UV lamp with 80 W for about 1 second thereby forming the protection layer with a thickness of about 5  $\mu\text{m}$ .

[0054]

Then, adhesive agent ad is coated on the periphery of aluminum deposited film 11a so that the width of adhesive agent ad is about 2 mm. Subsequently, reversible thermal recording material layer 14, which is obtained in a manner described above, is attached to aluminum deposited film 11a so that the protection layer is the front surface thereby forming rewritable region Rc. When rewritable region Rc, which is created in a manner described above, is heated from room temperature to the second temperature (about 130°C) and then cooled, the color of reversible thermal recording material layer 14 is fixed to white. In addition, when rewritable region Rc is heated from room temperature to the first temperature (about 90°C) and then cooled, the color of reversible thermal recording material layer 14 is fixed to transparent. Therefore, since the substrate [in this case, the color of aluminum deposited film 11a (blackish silver metal color)] can be seen from the outside, the color of the transparent region of reversible thermal recording material layer 14 is black.

[0055]

After two-dimensional code cp, character ch and/or message m are written in rewritable region Rc, rewritable region Rc is evenly heated to the first temperature (about 90°C) so

that reversible thermal recording material layer 14 is made transparent, the entire surface of rewritable region Rc is made blackish silver metal color and the previously-written information is deleted. Then, by whitening the transparent region of reversible thermal recording material layer 14 using a thermal head, which is heated to the second temperature (about 130°C), it is possible to rewrite a new two-dimensional code, character and/or message on the same place of rewritable region Rc, wherein two-dimensional code cp, character ch and/or message m are previously printed.

[0056]

More particularly, for example, in the case wherein the user interrupts the game when the identification code of the game program, which specifies game "01" in Figure 3, reaches the stage shown by a white arrow in Figure 4 in the operation of stage 1, the information that the identification code of the game program is "01" and, according to the example of Figure 5, the hierarchical stage is "1-1" is printed in the form of a two-dimensional code such as two-dimensional code cp of Figure 6.

[0057]

Even more particularly, according to the present embodiment, after the entire part of rewritable region Rc, wherein two-dimensional code cp is to be printed, is made

blackish silver metal color, the part other than two-dimensional code cp is heated to the second temperature (about 130°C) thereby producing the state shown in Figure 6. In addition, the character, which symbolizes hierarchical stage "1-1" reached by the user when he/she interrupts the game, is printed as character ch of Figure 6. Furthermore, the message, which corresponds to said character symbolizing hierarchical stage "1-1", is printed as message m of Figure 6.

[0058]

Here, in Figure 6, rewritable region Rc shows a diagram, which expresses character ch in the color of the paper and a diagram, which expresses message m in black. In reality, these diagrams are printed in white with a blackish silver metal color background. In the case wherein the user reaches the stage shown by a black arrow of Figure 4, for example, two-dimensional code cp of Figure 6 is rewritten and changed to the two-dimensional code, which includes at least the information that the user "finishes the game as the winner" and that the stage wherein the user "finishes the game as the winner" is hierarchical stage "n-1" of Figure 5. That is, the character, which symbolizes hierarchical stage "1-1", is rewritten and changed to the character, which symbolizes hierarchical stage "n-1", the

message, which corresponds to the character symbolizing hierarchical stage "1-1", is rewritten and changed to the message, which corresponds to the message corresponding to the character symbolizing hierarchical stage "n-1".

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[0059]

In addition, according to the present embodiment, reversible thermal recording material layer 14, which constitutes rewritable region Rc, is formed on aluminum deposited film 11a through air layer 13 so as to make it difficult to attach reversible thermal recording material layer 14 to aluminum deposited film 11a. Furthermore, heat-resistant layer 12 is formed on aluminum deposited film 11a. Therefore, rewritable region Rc can endure the rewriting operation of about 300 times.

[0060]

Figure 8 is a block view illustrating the internal structure of printing/reading means 8 for the key card. Printing/reading means 8 for the key card is comprised of center processing unit (CPU) 21, which controls the entire function of printing/reading means 8 for the key card, solid object imaging means 22 such as a CCD camera, memory unit 23, which temporarily stores the image information taken by solid object imaging means 22, printing means 24,

key card detection means 25, which are made from an infrared ray emitting element (infrared ray emitting element 25a in Figures 9 and 10) and an infrared ray receiving element (infrared ray receiving element 25b in Figures 9 and 10), switch-type card detection means 26, and rollers (rollers 27 in Figures 9 and 10), which store key card C inserted through card insertion opening (card insertion opening 8a in Figure 2) in the back, discharge said key card C inserted to card insertion opening 8a to the outside of card insertion opening 8a and is rotatably driven by a driving means (not shown in the figures) such as a motor.

[0061]

Here, in Figures 9 and 10, 28 represents a platform. When key card C is inserted to card insertion opening 8a, rewritable region Rc of key card C is positioned immediately above platform 28. Center processing unit (CPU) 21 is comprised of a decoder means (not shown in the figures) for converting the two-dimensional image information, which is taken by solid object imaging means 22 and temporarily stored in memory unit 23, to a JIS code and the like, and an encoder means (not shown in the figures) for converting the JIS code and the like, which



are transmitted from host computer 2, to a two-dimensional code.

[0062]

In addition, according to the present embodiment, as printing means 24, a thermal head type printing means is used. Thermal head 24a of printing means 24 is normally placed outside of the imaging visual field of solid object imaging means 22. When signal processing unit (CPU) 21 issues a printing command, printing [normally, called "inji (letter printing)". However, according to the present specification, the term "insatsu (printing)" is used so that the printing operation is not limited to letter printing.] can be made on rewritable region Rc of key card C, which is positioned above platform 28, by thermal transfer.

[0063]

In addition, infrared ray emitting element 25a and infrared ray receiving element 25b, which constitute card detection means 25, are positioned in the entrance side of card insertion opening 8a facing to each other. Switch-type card detection means 26 is always turned off by an elastic body such as a spring and positioned in the back of card insertion opening 8a. When the switch is turned on, an on-signal is outputted to center processing unit (CPU) 21.

[0064]

Next, the operation of printing/reading means 8 for the key card will be described. Figure 9 shows schematic views illustrating the procedure, wherein printing/reading means 8 for the key card reads the two-dimensional code, which is written in key card C. Figure 9 (a) shows the state before key card C is inserted into card insertion opening 8a of printing/reading means 8 for the key card. Figure 9 (b) shows the state before key card C is inserted into card insertion opening 8a. Figure 9 (c) shows the state wherein solid object imaging means 22 is reading the information, which is written in rewritable region Rc of key card C.

[0065]

Two frame members 31 are mounted inside card insertion opening 8a. Each of frame members 31 has roller 27. Each of rollers 27 can rotate in both forward and reverse directions by a driving means (not shown in the figure) such as a motor. Electricity is supplied from a power source to infrared ray emitting element 25a. At the same time, when the main switch (not shown in the figure) of printing/reading means 8 for the key card is turned on, infrared ray emitting element 25a constantly emits infrared rays to infrared ray receiving element 25b.

[0066]

While infrared ray receiving element 25b receives infrared rays from infrared ray emitting element 25a, it transmits an infrared ray receiving signal to center processing unit (CPU) 21. While center processing unit (CPU) 21 receives the infrared ray receiving signal from infrared ray receiving element 25b, it determines that key card C is not inserted to card insertion opening 8a and stops the rotation of rollers 27 [see Figure 9 (a)].

[0067]

In the meantime, while infrared ray receiving element 25b no longer receives infrared rays from infrared ray emitting element 25a, it determines that key card C is inserted to card insertion opening 8a and makes rollers 27 rotate in the forward direction (according to the present specification, the direction of the rotation of rollers 27, wherein key card C is pulled into the back of card insertion opening 8a, is called "rotation in the forward direction") so that key card C is pulled into the back of card insertion opening 8a.

[0068]

Switch-type card detection means 26, which is always turned off, is placed in the back of card insertion opening 8a.

Card detection means 26 is connected to central processing unit (CPU) 21.

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When rollers 27 rotate in the forward direction, key card C is pulled into the back of card insertion opening 8a and card detection means 26 is turned on. As a result, card detection means 26 transmits an on-signal to central processing unit (CPU) 21.

[0069]

When central processing unit (CPU) 21 receives the on-signal, which is transmitted from card detection means 26, it determines that key card C is inserted to the back of card insertion opening 8a and stops the rotation of rollers 27 [see Figure 9 (b)]. After stopping the rotation of rollers 27, central processing unit (CPU) 21 transmits a signal for releasing the shutter of solid object imaging means 22. When solid object imaging means 22 receives the shutter-releasing signal from central processing unit (CPU) 21, it releases the shutter of solid object imaging means 22 so that the image information on rewritable region Rc of key card C, which is taken by solid object imaging means 22, is temporarily stored in memory unit 23 [see Figure 9 (c)].

[0070]

Then, based on the image information, which is temporarily stored in memory unit 23, the two-dimensional code is extracted. In accordance with the decoder means (not shown in the figure), the two-dimensional code is decoded to a JIS code. Subsequently, according to the present embodiment, the information decoded into the JIS code, is temporarily stored in memory unit 23. Then, the identification code of the game program, which is contained in the two-dimensional code, is transmitted to the host computer via communication line L.

[0071]

Here, according to the present embodiment, printing/reading means 8 for the key card cannot find a two-dimensional code in rewritable region Rc of key card C, a plurality of types of game programs, which can be selected by game terminal 3, is displayed on display screen 5 of game terminal 3. When the user selects his/her desired game from the selectable game programs, the identification code of said selected game program is transmitted to host computer 2. When host computer 2 receives the identification code of the game program, which is selected in game terminal 3, it loads the game program corresponding to said identification code of the game program to game terminal 3. As a result, the user

can enjoy the game, which is selected by him/herself, from the beginning.

[0072]

In addition, according to the present embodiment, in the case wherein printing/reading means 8 for the key card finds a two-dimensional code in rewritable region Rc of key card C, a decoder means (not shown in the figure) decodes the two-dimensional code to an identification code of the game program, which is contained in the two-dimensional code, a stage identification code for the hierarchical stage of the game program and a JIS code. Then, the identification code, which specifies the game program, is transmitted to host computer 2. When host computer 2 receives the identification code of the game program from printing/reading means 8 for the key card, it loads the game program corresponding to said identification code of the game program to game terminal 3. When game terminal 3 receives the game program, it skips the stages of said game program and starts the stage, which corresponds to the stage identification code.

[0073]

As a result, the user can enjoy the game, which is previously selected by him/herself, from the stage, which is previously interrupted. Figure 10 shows schematic views

illustrating the procedure wherein printing/reading means 8 writes information in key card C. Figure 10 (a) shows the state wherein printing/reading means 8 for the key card writes data in rewritable region Rc of key card C, which is inserted into card insertion opening 8a. Figure 10 (b) shows the state wherein key card C is returned.

[0074]

According to communication game system 1, in the case wherein the user has to interrupt the game for certain reasons in the middle of the game, which is selected by him/herself, he/she can interrupt the game by operating operational unit 6 accordingly. For example, according to the present embodiment, if the user simultaneously presses all of the four push buttons 6a of operational unit 6, he/she can interrupt the game. Here, the operation of interrupting the game, which is described above, is simply an example. The present invention is not limited to it.

[0075]

When the user makes the operation of interrupting the game in the middle of the game, which is selected by him/herself, the identification code of the game program of the running game and the stage identification code, which specifies the stage of the game when the game is interrupted, are encoded into a two-dimensional code by an

encoder means (not shown in the figure) of central processing unit (CPU) 21.

[0076]

After that, by using the encoder means (not shown in the figure), central processing unit (CPU) 21 issues a command to print the two-dimensionally encoded identification code of the game program and the stage identification code, which specifies the stage when the user interrupts the game, to printing means 24. At the same time, in accordance with the identification code of the selected game program and the stage identification code, which specifies the stage when the user interrupts the game, central processing unit (CPU) 21 extracts the character, which symbolizes the stage of the selected game program when the user interrupts the game, from the information on the game program, which is loaded from host computer 2. Then, central processing unit (CPU) 21 issues a command to print said extracted character in the form of image information to printing means 24.

[0077]

In addition, according to the present embodiment, central processing unit (CPU) 21 issues a command to print the message information of the extracted character in the form



of information such as letters, figures and codes and the like to printing means 24.

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When printing means 24 receives the printing command signal from central processing unit (CPU) 21, by using thermal head 24a, it prints the two-dimensional code, which contains the information on the identification code of the selected game program and the stage identification code specifying the stage when the user interrupts the game, the character, which symbolizes the stage of the selected game program when the user interrupts the game, and the message information of said character, as visual information.

[0078]

Furthermore, according to communication game system 1, in the case wherein the user finishes the selected game as the winner, the two-dimensional code, which contains the message information that the user finishes the game as the winner, the character, which symbolizes the hierarchical stage reached by the user when he/she finishes the game as the winner, and the message information of said character are printed as visual information. In addition, according to communication game system 1, in the case wherein the user lets the selected game to be over, the two-dimensional code, which contains the message information that the user

lets the game end, the character, which symbolizes the hierarchical stage reached by the user when he/she lets the game end, and the message information of said character are printed as visual information.

[0079]

In the above described case, according to the present embodiment, when printing means 24 receives the printing command signal, it increases the temperature of the thermal head to the first temperature (about 90°C) so that rewritable region Rc of key card C is evenly operated and the entire rewritable region Rc of key card C is made blackish silver metal color. Then, printing means 24 changes the temperature of the thermal head to the second temperature (about 130°C) and writes the white part of the character and messages in white on rewritable region Rc, which is made blackish silver metal color [see Figure 10 (a)].

[0080]

When printing means 24 finishes printing the two-dimensional code, character and message information of said character on rewritable region Rc of key card C, central processing unit (CPU) 21 makes rollers 27 rotate in the reverse direction (according to the present specification, the direction of the rotation of rollers 27, wherein key

card C is discharged from card insertion opening 8a, is called "rotation in the reverse direction") so that key card C is discharged from card insertion opening 8a.

[0081]

When infrared ray receiving element 25b receives infrared rays from infrared ray emitting element 25a once again and central processing unit (CPU) 21 receives the infrared ray receiving signal from infrared ray receiving element 25b, it stops the rotation of rollers 27 [see Figure 10 (b)]. As a result, when the user interrupts the game, the two-dimensional code, which contains the information on the identification code of the selected game program and the stage identification code specifying the stage when the user interrupts the game, the character, which symbolizes the hierarchical stage reached by the user when he/she interrupts the game, and the message information on said character are printed on key card C as visual information and key card C is returned to the user (see Figure 6).

[0082]

Next, the procedure, wherein the user plays the game according to communication game system 1, and the operation of communication game system 1 will be described. Here, to make communication game system 1 more practical, handling of fee (including income) information will also be

described. Figure 11 is a flowchart illustrating the procedure, wherein the user plays the game according to communication game system 1, and the operation of communication game system 1.

[0083]

This section will describe the case wherein the two-dimensionally encoded information, which is written in rewritable region Rc of key card C, includes income information in addition to the identification code of the game program selected by the user and the stage identification code specifying the stage when the user interrupts the game.

[0084]

When the user is to play a game in game terminal 3, in step S1, he/she inserts key card C into card insertion opening 8a of printing/reading means 8 for the key card, which is connected to game terminal 3. Then, by using solid object imaging means 22, printing/reading means 8 for the key card takes an image of rewritable region Rc of key card C in a manner shown in step S2.

[0085]

The image information, which is taken by solid object imaging means 22, is temporarily stored in memory unit 23. Then, the decoder means (not shown in the figure) examines

whether or not the image information contains a two-dimensional code. If the image information contains a two-dimensional code, it is decoded to a JIS code. Then, whether or not the information, which is decoded into a JIS code by the decoder means (not shown in the figure), contains income information is examined in step S3.

[0086]

In step S3, if the two-dimensional code, which is taken by solid object imaging means 22, contains income information, whether or not the amount of money in the income information is larger than the game fee is determined. If the amount of money in the income information is larger than the game fee, step S3 is followed by step S4. In step S4, whether or not the two-dimensional code, which is taken by solid object imaging means 22, contains the identification code specifying the game program and the hierarchical stage identification code specifying a plurality of hierarchical stages of the game program is determined.

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[0087]

In step S3, if the two-dimensional code, which is taken by solid object imaging means 22, contains income information, but it is determined that the amount of said income

information is smaller than the game fee, step S3 is followed by step S5. In step S5, a message asking the user to insert a necessary amount of coins to coin inserter 7 [for example, "To play the game, (number X) more coins are needed. Please insert the necessary amount of coins."], is displayed on display screen 5.

[0088]

In addition, in step S3, if the two-dimensional code, which is taken by solid object imaging means 22, does not contain income information (the remaining amount is 0 yen), step S3 is followed by step S4. In step S4, a message asking the user to insert a necessary amount of coins to coin inserter 7 (for example, "To play the game, please insert coins."), is displayed on display screen 5.

[0089]

When the user inserts the necessary amount of coins to coin inserter 7 in accordance with the message displayed on display screen 5, step 3 is followed by step S4. In step S4, whether or not the two-dimensional code, which is taken by solid object imaging means 22, contains the identification code specifying the game program and the stage identification code specifying a plurality of hierarchical stages of said game program is determined.

[0090]

In step S4, in the case wherein it is determined that the two-dimensional code, which is taken by solid object imaging means 22, contains the identification code specifying the game program and the stage identification code specifying a plurality of hierarchical stages of said game program, step S4 is followed by step S6. In step S6, printing/reading means 8 for the key card transmits the identification code specifying the game program to host computer 2 via communication line L.

[0091]

When host computer 2 receives the identification code specifying the game program and the stage identification code specifying a plurality of hierarchical stages of said game program from printing/reading means 8 for the key card, it loads the game program, which corresponds to the received identification code of the game program, to game terminal 3 (step S7).

[0092]

When the game program is loaded to game terminal 3, game terminal 3 skips hierarchical stages of the received game program and reaches the stage, which is specified by the stage identification code read from the two-dimensional code (see step S8). As a result, the user can restart the

previously-interrupted game from the previously-interrupted stage (see step S9).

[0093]

In the meantime, in step S4, in the case wherein it is determined that the two-dimensional code, which is taken by solid object imaging means 22, does not contain the identification code specifying the game program and the stage identification code specifying a plurality of hierarchical stages of said game program, a plurality of types of game programs, which can be selected by the user, are displayed on display screen 5. At the same time, a message, which allows the user to select his/her desired game among the selectable game programs (for example, "Please use the joy stick to move the cursor to the game you want to select. Then, press the push button in the upper right.", is displayed (see step S10).

[0094]

In step S10, when the user selects the game in accordance with the message displayed on display screen 5, step S10 is followed by step S11. In step S11, game terminal 3 transmits the identification code of the game program, which is selected by the user, to host computer 2 via communication line L. When host computer 2 receives the identification code specifying the game program, which is



transmitted from game terminal 3, it loads the game program, which corresponds to the received identification code of the game program, to game terminal 3 (see step S12).

[0095]

As a result, the user can enjoy the game, which selected by him/herself from display screen 5 of game terminal 3, from the beginning (stage 1) (see step S13). In the case wherein the user finishes the selected game as the winner (see step S14), central processing unit (CPU) 21 extracts the image information on the character (according to the present embodiment, the character, which symbolizes the hierarchical stage reached by the operation of the user in stage 5 shown in Figure 5) from the game program, which is loaded from host computer 2 to game terminal 3, and transmits a printing command signal to printing means 24 so that printing means 24 prints said character on a predetermined position of rewritable region R<sub>c</sub> of key card C as a visual image.

[0096]

In addition, according to the present embodiment, in the case wherein the user finishes the game as the winner (see step S14), central processing unit (CPU) 21 extracts the message information (including the income information),

which corresponds to the character (according to the present embodiment, the character, which symbolizes the hierarchical stage reached by the operation of the user in the stage 5 shown in Figure 5) when the user finishes the game as the winner, from the game program, which is loaded from host computer 2 to game terminal 3, and transmits a printing command signal to printing means 24 so that printing means 24 prints said extracted character on a predetermined position of rewritable region Rc of key card C as visual letters, or depending on the case, as a visual figure or code.

[0097]

Furthermore, according to the present embodiment, the income information, which corresponds to each of the hierarchical stages, wherein the user finishes the selected game. In the case wherein the user finishes the selected game as the winner, central processing unit (CPU) 21 encodes the information that the user finishes the game as the winner (message that the user "finishes the game as the winner"), the stage identification code of the stage, which is reached by the user, and the income information of the hierarchical stage reached by the user into a two-dimensional code by using an encoder means (not shown in the figure). Then, central processing unit (CPU) 21 issues

a printing command signal to printing means 24 so that printing means 24 prints said two-dimensional code, which is created by the encoder means (not shown in the figure), on a predetermined position of rewritable region Rc of key card C.

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[0098]

When printing means 24 receives the printing command signal for printing character, message and two-dimensional code from central processing unit (CPU) 21, it prints them on a predetermined position of rewritable region Rc of key card C. In this case, when printing means 24 receives the printing command signal, in accordance with the procedure and operation of Figure 10 (a), it writes the black color part of the two-dimensional code, character and message on rewritable region Rc, which is whitened (see steps S15, S16 and S17).

[0099]

When central processing unit (CPU) 21 confirms that the printing operation by printing means 24 is completed, it returns key card C to the user in accordance with the procedure and operation of Figure 10 (b). Therefore, from the character printed on key card C and the message (including the income information), the user can visualize

the fact that he/she finishes the game as the winner and enjoy the game.

[0100]

Here, according to the present embodiment, key card C contains the two-dimensionally-encoded information that the user finishes the game as the winner (message that the user "finishes the game as the winner"), the hierarchical stage identification code reached by the user when he/she finishes the game as the winner, and the income information on the hierarchical stage reached by the user.

[0101]

In the case wherein key card C is inserted to card insertion opening 8a of printing/reading means 8 for the key card of one of several game terminals 3, after central processing unit (CPU) 21 confirms the income information, it displays the message, which asks the user to select the game, on the display screen of game terminal 3, which is connected to printing/reading means 8 for the key card wherein key card C is inserted (see steps S2 and S5 of the flowchart of Figure 11).

[0102]

In addition, in the case wherein the user lets the game end (see step S14), central processing unit (CPU) 21 extracts the image information on the character (according to the

present embodiment, the character, which symbolizes the hierarchical stage reached by the user when the game is over) from the game program, which is loaded from host computer 2 to game terminal 3. Then, central processing unit (CPU) 21 puts a mark (for example, an angel ring), which symbolizes the death of the character, to the head of the extracted character. Subsequently, central processing unit (CPU) 21 issues a printing command signal to printing means 24 so that printing means 24 prints the character with said mark, which symbolizes the death of the character, as a visible image on a predetermined position of rewritable region Rc of key card C. Furthermore, according to the present embodiment, in the case wherein the user lets the selected game to be over (see step S18), central processing unit (CPU) 21 extracts the message information at the time of the game over from the game program, which is loaded from host computer 2 to game terminal 3, and transmits a printing command signal to printing means 24 so that printing means 24 prints said extracted character on a predetermined position of rewritable region Rc of key card C as visual letters, or depending on the case, as a visual figure or code.

[0103]

In addition, in the case wherein the user lets the selected game to be over, central processing unit (CPU) 21 encodes the information that the user lets the game end (message that "the game is over") and the income information that the remaining income is zero into a two-dimensional code by using an encoder means (not shown in the figure). Then, central processing unit (CPU) 21 issues a printing command signal to printing means 24 so that printing means 24 prints said two-dimensional code, which is created by the encoder means (not shown in the figure), on a predetermined position of rewritable region Rc of key card C.

[0104]

When printing means 24 receives the printing command signal for printing character, message and two-dimensional code from central processing unit (CPU) 21, it prints them on a predetermined position of rewritable region Rc of key card C. In this case, when printing means 24 receives the printing command signal, in accordance with the procedure and operation of Figure 10 (a), it writes the black color part of the two-dimensional code, character and message on rewritable region Rc, which is whitened (see steps S19, S20 and S21).

[0105]

When central processing unit (CPU) 21 confirms that the printing operation by printing means 24 is completed, it returns key card C to the user in accordance with the procedure and operation of Figure 10 (b). Therefore, from the character printed on key card C and the message (including the income information), the user can visualize the fact that he/she lets the game end.

[0106]

In addition, in the case wherein the user interrupts the selected game (see step S22), central processing unit (CPU) 21 extracts the image information on the character, which symbolizes the hierarchical stage reached by the user when he/she interrupts the game, from the game program, which is loaded from host computer 2 to game terminal 3. Then, central processing unit (CPU) 21 issues a printing command signal to printing means 24 so that printing means 24 prints said character on a predetermined position of rewritable region Rc of key card C as a visual image.

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[0107]

Furthermore, according to the present embodiment, in the case wherein the user interrupts the selected game (see step S22), central processing unit (CPU) 21 extracts the

message information (depending on the hierarchical stage, the message information includes income information) corresponding to the character, which symbolizes the hierarchical stage reached by the user when he/she interrupts the game, from the game program, which is loaded from host computer 2 to game terminal 3. Then, central processing unit (CPU) 21 transmits a printing command signal to printing means 24 so that printing means 24 prints said extracted message on a predetermined position of rewritable region Rc of key card C as visual letters, or depending on the case, as a visual figure or code.

[0108]

In addition, in the case wherein the user interrupts the game, central processing unit (CPU) 21 encodes the identification code of the game program, which is selected when the user interrupts the game, the hierarchical stage identification code, which specifies the hierarchical stage reached by the user when he/she interrupts the game, and the information on the remaining income, into a two-dimensional code. Subsequently, central processing unit (CPU) 21 issues a printing command signal to printing means 24 so that printing means 24 prints said two-dimensional code, which is created by an encoder means (not shown in



the figure), on a predetermined position of rewritable region Rc of key card C.

[0109]

When printing means 24 receives the printing command signal for printing character, message and two-dimensional code from central processing unit (CPU) 21, it prints them on a predetermined position of rewritable region Rc of key card C. In this case, when printing means 24 receives the printing command signal, in accordance with the procedure and operation of Figure 10 (a), it writes the black color part of the two-dimensional code, character and message on rewritable region Rc, which is whitened (see steps S23, S24 and S25).

[0110]

When central processing unit (CPU) 21 confirms that the printing operation by printing means 24 is completed, it returns key card C to the user in accordance with the procedure and operation of Figure 10 (b). Therefore, from the character printed on key card C and the message (including the income information), the user can visualize the fact that he/she interrupts the game and the character symbolizing the hierarchical stage reached by him/herself. In addition, the user can find out that he/she can restart

the game from the stage, which is previously interrupted, with another game terminal 3.

[0111]

According to communication game system 1, since the user can enjoy a plurality of games with a single game terminal 3, compared with the specialized game device, which is individually developed for a single game, it is possible to play many types of games in a small space. In addition, the user can enjoy a plurality of games with single game terminal 3 without moving the place.

[0112]

Furthermore, when the user interrupts the game, he/she can restart the game from the hierarchical stage, which is previously interrupted, from game terminal 3, which is installed in a different place, only by inserting key card C into card insertion opening 8a of printing/reading means 8 for the key card, which is connected to said game terminal 3.

[0113]

As a result, while the user enjoys the game in game terminal 3, which is installed in one place, if he/she no longer has the time to play the game, it is no longer necessary for him/her to force the end of the game and

start the game from the beginning with game terminal 3, which is installed in another place.

[0114]

In addition, since the game restart information is printed on key card C in the form of a two-dimensional code, compared with the one-dimensional bar code, it is possible to record a large volume of information in a small region. Furthermore, different from the case of the one-dimensional bar code, there is no rigid standard on the thickness of the lines and the intervals between each of the lines. Therefore, as printing means 24 of printing/reading means 8 for the key card, it is not necessary to use a special printer, which is required for the case of the one-dimensional bar code. Instead, it is possible to use thermal head type printing mean 24, which is commonly used. Therefore, it is possible to keep the manufacturing cost of communication game system 1 low.

[0115]

Moreover, other than the two-dimensional code, the picture and message of the character are written on key card C as visual information. At the same time, said character and message are sequentially changed as the game advances.

Therefore, the user can visually enjoy card C itself and the card C, wherein said picture and message of the

character are written, becomes the subject of a collection in a manner similar to the telephone card and menko (pogs) and the like.

[0116]

In addition, according to key card C, other than the character, which symbolizes the hierarchical stage reached by the user when he/she interrupts the running game by operating game terminal 3, the message of said character is also printed on key card C. Therefore, it is entertaining to look at key card C as well as read the message on it. As a result, key card C does become the subject of a collection in a manner similar to the telephone card and menko (pogs) and the like. Consequently, collecting the key cards gives the user another pleasure other than the pleasure of playing the game.

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[0117]

Furthermore, according to communication game system 1, rewritable region Rc, which is made from a reversible thermal material, is created on key card C, which is used as the recording medium, so that the game restart information is printed on the card by thermal head type printer 24. Therefore, it is no longer necessary to supply ink to printing means 24 of printing/reading means 8 for

the key card. As a result, it is no longer necessary to do the maintenance operations such as inspection of the ink shortage in printing/reading means 8 for the key card and the corresponding ink replenishment. Consequently, it is possible to decrease the workload of the maintenance workers such as employees of the game center and the service engineers for communication game system 1.

[0118]

In addition, since the two-dimensionally-encoded information and the information on the character and message can be printed on key card C by single printing means 24, as the recording medium, it is no longer necessary to use the magnetic writing means, which is required when a magnetic tape is used. Consequently, it is possible to simplify the communication game system.

Furthermore, according to communication game system 1, since the income information is included in the two-dimensional code, which is printed on key card C, it is possible to use key card C as the prepaid card in the game center.

[0119]

The above described embodiment is merely an example of the communication game system according to the present invention. Key card C for continuously playing the game

does not necessarily have rewritable region Rc, which is made from a reversible thermal material. The two-dimensional code, character and message may be printed on the surface of the main body of key card C by commonly-used ink or toner. In addition, a sticker, wherein the two-dimensional code, character or message is printed, may be attached to the main body of key card C.

[0120]

Furthermore, the game restart information may be sequentially and recordably printed in the form of a two-dimensional code on key card C. Alternately, the character or message may be sequentially and recordably printed on key card C. As a result, when the user finishes the game as the winner or lets the game end, he/she can enjoy reading the game history from a plurality of two-dimensional codes, characters or messages, which are sequentially and recordably printed on key card C.

[0121]

[Effects of the Invention]

According to the communication game system as set forth in claim 1, a key card for continuously playing the game, wherein the game restart information is printed in the form of a two-dimensional code, is used as the recording medium. When the user plays a game halfway in a game terminal,

which is installed in one place, and then interrupts the game, he/she can restart the game from the stage, wherein the game is previously interrupted, in another time or in another game terminal, which is installed in another place, simply by inserting the above described key card into the printing/reading means for the key card of said different game terminal installed in said different place.

[0122]

According to the conventional communication game system, when the user is playing a game in a game terminal, which is installed in one place, and no longer has the time to play, he/she forces the end of the game and starts the game from the beginning with another game terminal, which is installed in another place. This spoils the game. Instead, according to the communication game system of the present invention, the user does not have to play the game in a manner described above. In addition, according to the communication game system of the present invention, since the game restart information is printed in the form of a two-dimensional code, compared with the one-dimensional bar code, it is possible to record a large volume of information in a small region.

[0123]

Furthermore, according to the communication game system of the present invention, different from the case of the one-dimensional bar code, there is no rigid standard on the thickness of the lines and the intervals between each of the lines. Therefore, as the printing means, it is not necessary to use a special printer, which is required for the case of the one-dimensional bar code. Instead, it is possible to use a commonly-available printing means. Therefore, it is possible to keep the manufacturing cost of the communication game system low. According to the communication game system as set forth in claim 2, a rewritable region, which is made from a reversible thermal material, is created on the key card, which is used as the recording medium, so that the game restart information is printed on the card by a thermal head type printer.

[0124]

Therefore, it is no longer necessary to supply ink to the printing means of the printing/reading means for the key card. As a result, it is no longer necessary to do the maintenance operations such as inspection of the ink shortage in the printing/reading means for the key card and the corresponding ink replenishment. Consequently, it is possible to decrease the workload of the maintenance



workers such as employees of the game center and the service engineers for the communication game system.

[0125]

According to the communication game system as set forth in claim 3, an identification code for specifying the game program, is assigned to each of the game programs, which are stored in the host computer, and a stage identification code for specifying the hierarchical stage, is assigned to each of the hierarchical stages, which constitute a tree structure of each of the game programs. The identification code specifying the game program, which is interrupted by the user, and the stage identification code of the hierarchical stage, which is reached by the user when he/she interrupts the game, are printed on the key card in the form of a two-dimensional code. Based on the two-dimensional code, which is printed on the key card, it is possible to easily specify the game program, which is interrupted by the user, and the hierarchical stage, which is reached by the user when he/she interrupts the game. Therefore, by inserting the key card into the printing/reading means for the key card, the user can restart the interrupted game from the stage, wherein the game is previously interrupted.

[0126]

According to the communication game system as set forth in claim 4, the character, which symbolizes the hierarchical stage reached by the user when he/she interrupts the running game by operating the game terminal, is printed on the key card. As a result, since it is entertaining to look at the key card, the key card itself becomes the subject of a collection in a manner similar to the telephone card, baseball card, monster card and menko (pogs) and the like. Consequently, collecting the key cards gives the user another pleasure other than the pleasure of playing the game.

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[0127]

According to the communication game system as set forth in claim 5, in addition to the character, which symbolizes the hierarchical stage reached by the user when he/she interrupts the running game by operating the game terminal, the message of said character is also printed on the key card. Therefore, it is entertaining to look at the key card as well as read the message on it. As a result, the key card itself becomes the subject of a collection in a manner similar to the telephone card, baseball card, monster card and menko (pogs) and the like. Consequently, collecting the

key cards gives the user another pleasure other than the pleasure of playing the game.

[0128]

According to the communication game system as set forth in claim 6, since the income information is included in the two-dimensional code, which is printed on the key card, it is possible to use the key card as the prepaid card in the game center. According to the key card, as set forth in claim 7, for continuously playing the game, a two-dimensional code is printed on said key card.

[0129]

Since the two-dimensional code is recognized as a pattern by the human eyes, it gives spice to the key card itself. As a result, the key card does become the subject of a collection in a manner similar to the telephone card and menko (pogs) and the like. Consequently, collecting the key cards gives the user another pleasure other than the pleasure of playing the game.

[0130]

According to the key card, as set forth in claim 8, for continuously playing the game, since the game restart information is rewritably printed in the form of a two-dimensional code, as the game advances, the form of the two-dimensional code changes and thus the user can enjoy

the ever-changing two-dimensional code as patterns.

According to the key card, as set forth in claim 9, for continuously playing the game, since the game restart information is sequentially and recordably printed in the form of a two-dimensional code, when the user finishes the game as the winner or lets the game end, he/she can enjoy reading the game history from a plurality of two-dimensional codes, which are sequentially and recordably printed.

[0131]

According to the key card, as set forth in claim 10, for continuously playing the game, other than the character, which symbolizes the hierarchical stage reached by the user when he/she interrupts the running game by operating the game terminal, the message of said character is also printed on the key card. Therefore, it is entertaining to look at the key card as well as read the message on it. As a result, the key card does become the subject of a collection in a manner similar to the telephone card and menko (pogs) and the like. Consequently, collecting the key cards gives the user another pleasure other than the pleasure of playing the game.

[0132]

According to the key card, as set forth in claim 11, for continuously playing the game, since the character is rewritten in sequence as the game advances, in addition to the pleasure of playing the game, the user can enjoy the growth of the character from the ever-changing character as the game advances.

[0133]

According to the key card, as set forth in claim 12, for continuously playing the game, since the character is sequentially and recordably printed as the game advances, when the user finishes the game as the winner or lets the game end, he/she can enjoy the game history from a plurality of characters, which are sequentially and recordably printed.

[Brief Description of the Drawings]

[Figure 1]

Figure 1 is a schematic view illustrating the structure of the communication game system according to the present invention.

[Figure 2]

Figure 2 is a perspective view illustrating the structure of the game terminal, which is used in the communication game system of Figure 1.

[Figure 3]

Figure 3 is a schematic view illustrating the structure of a plurality of types of game programs, which are stored in a host computer.

[Figure 4]

Figure 4 is a schematic view illustrating an example of the game programs, which are stored in the host computer.

[Figure 5]

Figure 5 is a schematic view illustrating the message information corresponding to the character, which symbolizes each of the hierarchical stages of the example of the game programs, which are stored in the host computer.

[Figure 6]

Figure 6 is a planar view illustrating an example of the key card, according to the present invention, for continuously playing the game.

[Figure 7]

Figure 7 is a cross-sectional view illustrating the rewritable region of the key card of Figure 6.

[Figure 8]

Figure 8 is a block view illustrating the internal structure of the printing/reading means of Figure 2 for the key card.

[Figure 9]

Figure 9 shows schematic views illustrating the procedure, wherein the printing/reading means for the key card reads the two-dimensional code, which is written in the key card. Figure 9 (a) shows the state before the key card is inserted into the card insertion opening of the printing/reading means for the key card. Figure 9 (b) shows the state before the key card is inserted into the card insertion opening. Figure 9 (c) shows the state wherein the solid object imaging means is reading the information, which is written in the rewritable region of the key card.

[Figure 10]

Figure 10 shows schematic views illustrating the procedure wherein the printing/reading means writes information in the key card for continuously playing the game. Figure 10 (a) shows the state wherein the printing/reading means for the key card writes data in the rewritable region of the key card, which is inserted into the card insertion opening. Figure 10 (b) shows the state wherein the key card is returned.

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[Figure 11]

Figure 11 is a flowchart illustrating the procedure, wherein the user plays the game according to the

communication game system of the present invention, and the operation of the communication game system.

[Figure 12]

Figure 12 is a schematic view illustrating the conventional communication game system.

[Figure 13]

Figure 13 is a perspective view illustrating the structure of the conventional game terminal.

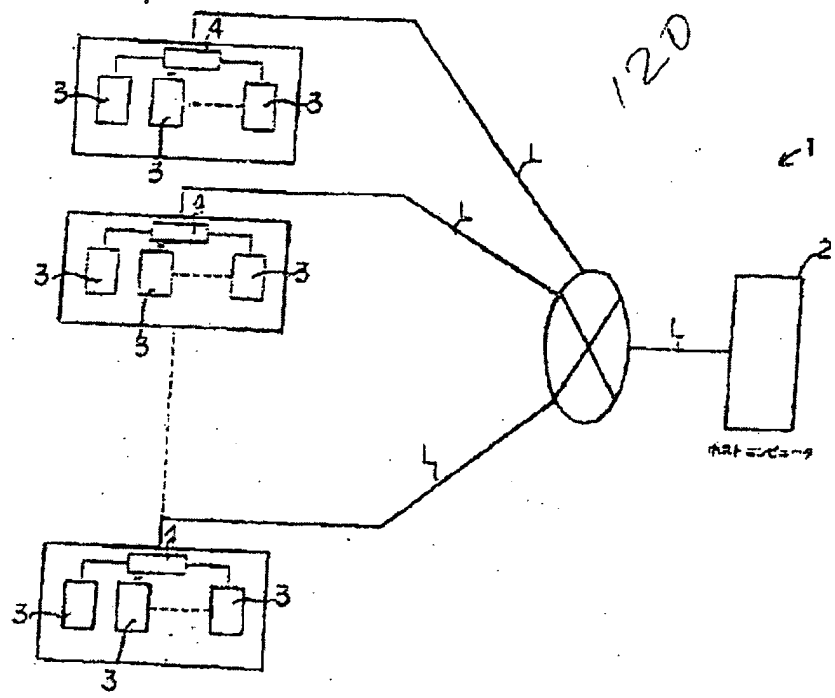
[Explanation of the Codes]

- 1: communication game system
- 2: host computer
- 3: game terminal
- 4: PBX
- 5: display means
- 6: operational means
- 6a: push button
- 6b: joy stick
- 7: coin inserter
- 8: printing/reading means for the key card
- 8a: coin insertion opening
- 11: substrate
- 11a: aluminum deposited film
- 12: heat-resistant layer
- 13: air layer



14: reversible thermal recording material layer  
21: central processing unit (CPU)  
22: solid object imaging means  
23: memory unit  
24: printing means  
25: key card detection means  
25a: infrared ray emitting element  
25b: infrared ray receiving element  
26: switch type card detection means  
27: roller  
28: platform  
31: frame member  
C: key card for continuously playing the game  
Rc: rewritable region  
L: communication line

[Figure 1]



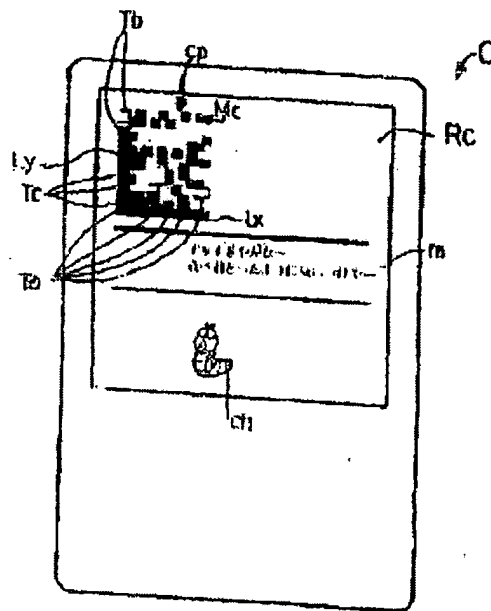
2: host computer

[Figure 3]

ID	ゲームプログラム名
01	〇〇〇
02	△△△
n	×××

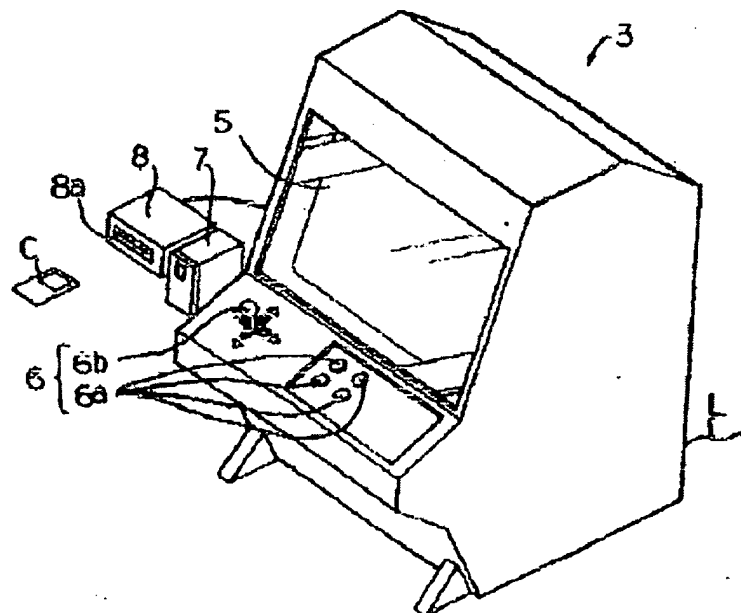
	Name of the game program

[Figure 6]







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[Figure 2]

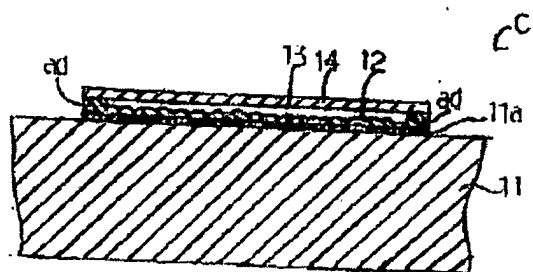


[Figure 5]

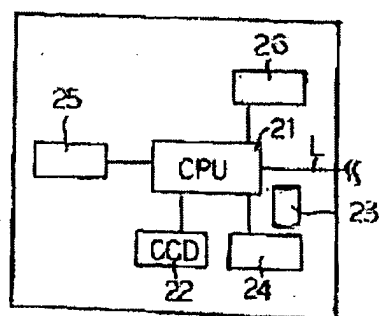
ステージID	キャラクター	メッセージ
1	1	 太りすぎやがね～ 肉を減さへんように気をつけや～
	2	 いいでえ。 この調子でがんばれや～。
	...	...
	n1	 あ～あ！ 骨と皮だけになってもうた～
2	1	
	2	
	...	
	n2	
n	1	
	2	
	...	
	nn	

Stage ID	Character	Message
1	1	You are too fat!
	2	Stop eating too much!
	..	Good!
	n1	Keep up the good work!
n	1	Oh no!
	2	You are nothing but bone and
	...	skin!
	nn	

[Figure 7]

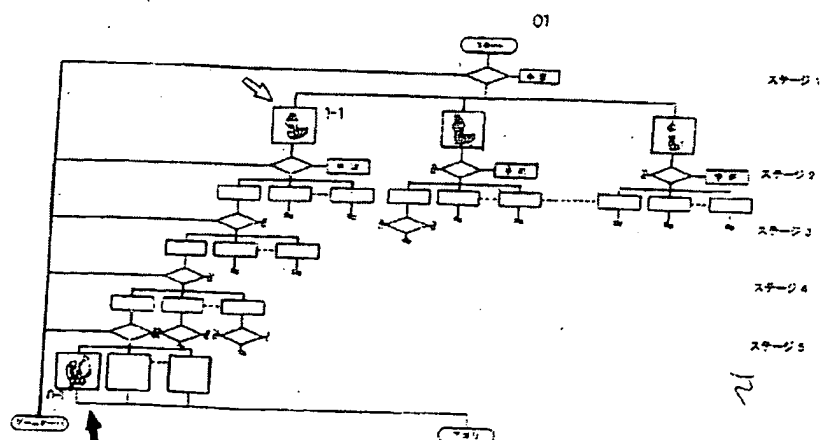


[Figure 8]



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[Figure 4]



(from top to bottom)

Start

Interrupted

... Stage 1

Interrupted, Interrupted, Interrupted

... Stage 2

... Stage 3

... Stage 4

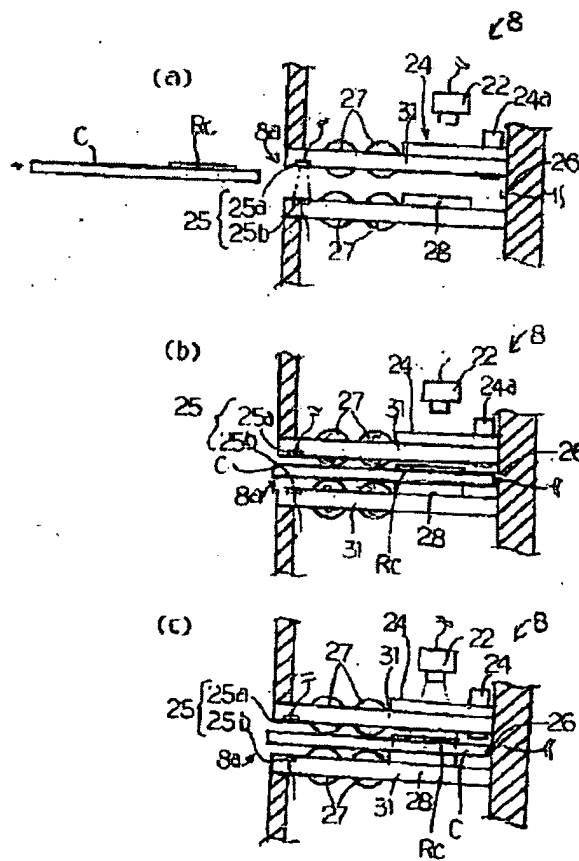
... Stage 5

Game is over

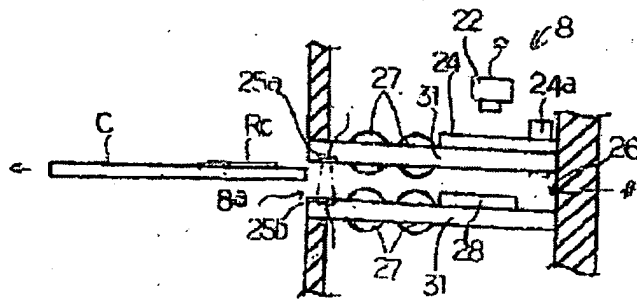
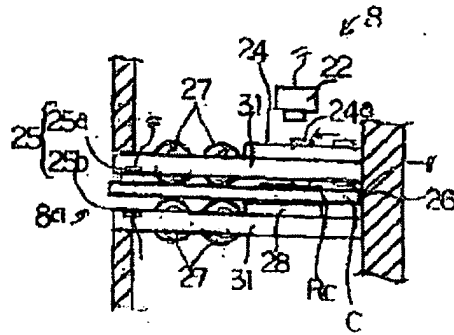
Winner

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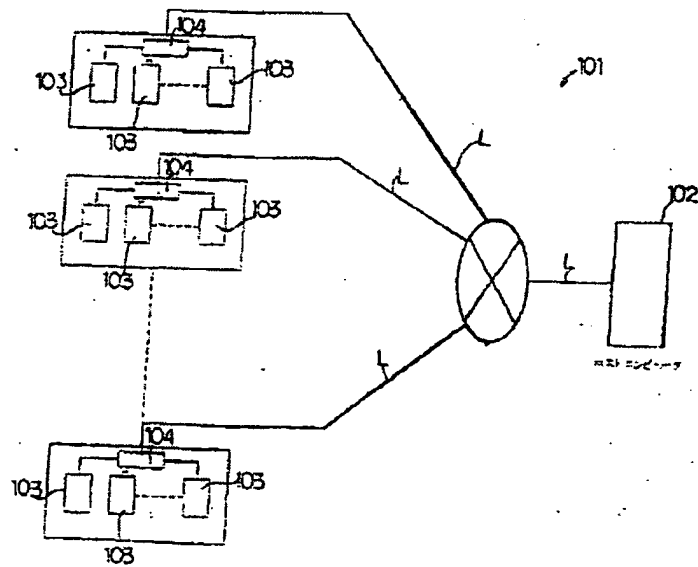
[Figure 9]



[Figure 10]

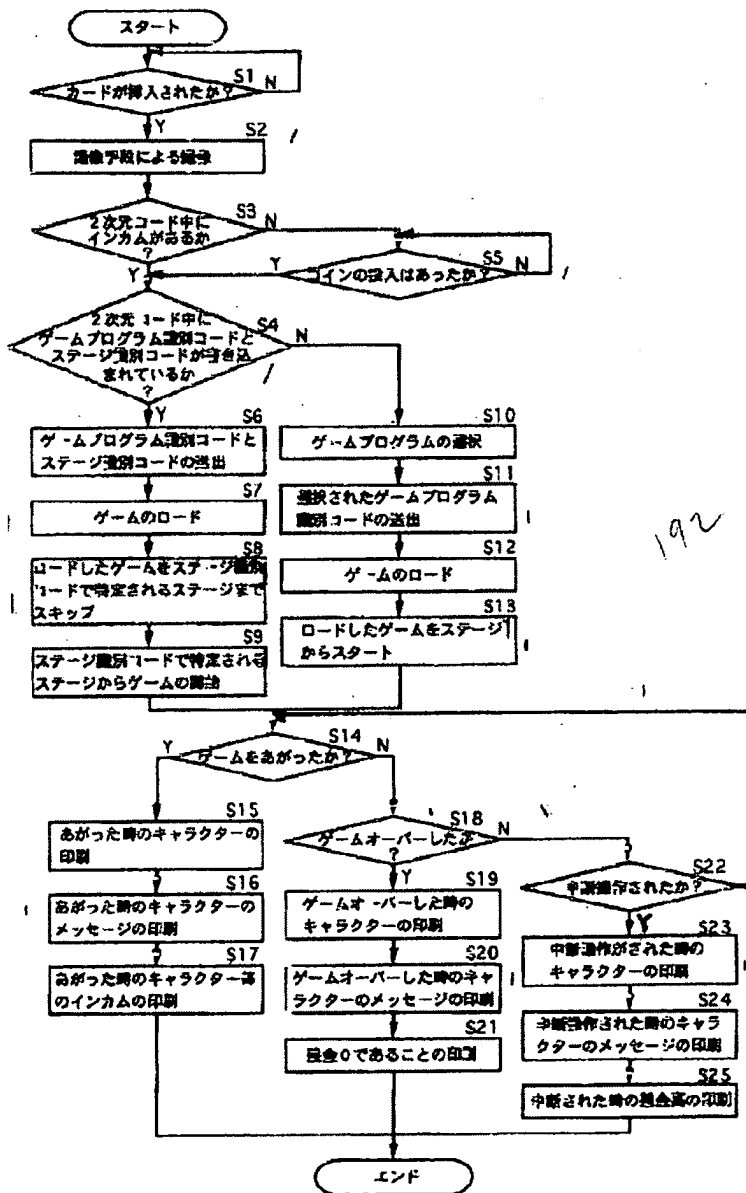


[Figure 12]



102: host computer

[Figure 11]



(from top to bottom)

Start

S1: Is the card inserted?

S2: An image is taken by the imaging means.

S3: Is the income contained in the two-dimensional code?



S5: Are coins inserted?

S4: Are the identification code of the game program and the stage identification code written in the two-dimensional code?

S6: Transmit the identification code of the game program and the stage identification code.

S7: Load the game.

S8: Skip the hierarchical stages of the loaded game to the hierarchical stage, which is specified by the identification code.

S9: Start the game from the hierarchical stage, which is specified by the stage identification code.

S10: Select the game program.

S11: Transmit the identification code of the selected game program.

S12: Load the game.

S13: Start the loaded game from stage 1.

S14: Does the user finish the game as the winner?

S15: Print the character when the user finishes the game as the winner.

S16: Print the message of the character when the user finishes the game as the winner.

S17: Print the income for the character when the user finishes the game as the winner.

S18: Does the user end the game?

S19: Print the character when the user end the game.

S20: Print the message of the character when the user ends the game.

S21: Print the statement that the remaining money is zero.

S22: Does the user interrupt the game?

S23: Print the character when the user interrupts the game.

S24: Print the message of the character when the user interrupts the game.

S25: Print the statement of the remaining money when the user interrupts the game.

End

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[Figure 13]

